

WHAT IS CLAIMED IS:

1. A pedal reaction force device for applying a prescribed reaction force to an operating pedal to be depressed by pedaling, comprising:

a reaction force generating unit for applying a pedaling reaction force to said operating pedal on the basis of displacement due to said operating pedal being mechanically displaced in accordance with a pedaling operation; and

a displacement characteristics regulating mechanism disposed between said reaction force generating unit and said operating pedal, which transmits said reaction force to said operating pedal and simultaneously mechanically sets a variation pattern of displacement magnitude of said reaction force generating unit with respect to a pedaling stroke of said operating pedal.

2. A pedal reaction force device according to claim 1, wherein said reaction force generating unit comprises:

a damper device for applying a pedaling reaction force to said operating pedal on the basis of circulation resistance of a fluid by being mechanically compressed or tensioned in accordance with a pedaling operation of said operating pedal; and

a spring member for applying a pedaling reaction force to said operating pedal on the basis of resilient deformation by being mechanically and resiliently deformed in accordance with a pedaling operation of said operating pedal;

wherein said displacement characteristics regulating mechanism intervenes between said damper device and/or said spring member and said operating pedal.

3. The pedal reaction force device according to claim 2, wherein said spring member is a coil spring that is substantially concentrically disposed at the outer circumferential side of said

damper device so as to surround said damper device and is compressed and tensioned in an integrated manner with said damper device in accordance with a pedaling operation of said operating pedal, and a variation pattern of displacement magnitude of said spring member and said damper device is defined by a single displacement characteristics regulating mechanism.

4. The pedal reaction force device according to claim 3, wherein said operating pedal is turned around a substantially horizontal support shaft by a pedaling operation, said displacement characteristics regulating mechanism is a cam whose dimension from said support shaft is continuously varied and which is turned around said support shaft in an integrated manner with said operating pedal, and said reaction force generating unit is engaged with said cam and is displaced in accordance with a variation pattern corresponding to a profile of a cam surface.

5. The pedal reaction force device according to claim 3, wherein said operating pedal is turned around a substantially horizontal support shaft by a pedaling operation, and

said displacement characteristics regulating mechanism comprises

a rocking lever which is pivotally disposed around a rocking shaft parallel to said support shaft and is connected to said reaction force generating unit; and

an interlocking mechanism which is disposed over both said rocking lever and said operating pedal and mechanically displaces said reaction force generating unit in a prescribed variation pattern by rocking said rocking lever in response to the pedaling stroke of said operating pedal.

6. The pedal reaction force device according to claim 2, wherein

said operating pedal is turned around a substantially horizontal support shaft by a pedaling operation, said displacement characteristics regulating mechanism is a cam whose dimension from said support shaft is continuously varied and which is turned around said support shaft in an integrated manner with said operating pedal, and said reaction force generating unit is engaged with said cam and is displaced in accordance with a variation pattern corresponding to a profile of a cam surface.

7. The pedal reaction force device according to claim 2, wherein said operating pedal is turned around a substantially horizontal support shaft by a pedaling operation, and

said displacement characteristics regulating mechanism comprises

a rocking lever which is pivotally disposed around a rocking shaft parallel to said support shaft and is connected to said reaction force generating unit; and

an interlocking mechanism which is disposed over both said rocking lever and said operating pedal and mechanically displaces said reaction force generating unit in a prescribed variation pattern by rocking said rocking lever in response to the pedaling stroke of said operating pedal.

8. The pedal reaction force device according to claim 1, wherein said operating pedal is turned around a substantially horizontal support shaft by a pedaling operation, said displacement characteristics regulating mechanism is a cam whose dimension from said support shaft is continuously varied and which is turned around said support shaft in an integrated manner with said operating pedal, and said reaction force generating unit is engaged with said cam and is displaced in accordance with a variation pattern corresponding

to a profile of a cam surface.

9. The pedal reaction force device according to claim 1, wherein said operating pedal is turned around a substantially horizontal support shaft by a pedaling operation, and

said displacement characteristics regulating mechanism comprises

a rocking lever which is pivotally disposed around a rocking shaft parallel to said support shaft and is connected to said reaction force generating unit; and

an interlocking mechanism which is disposed over both said rocking lever and said operating pedal and mechanically displaces said reaction force generating unit in a prescribed variation pattern by rocking said rocking lever in response to the pedaling stroke of said operating pedal.